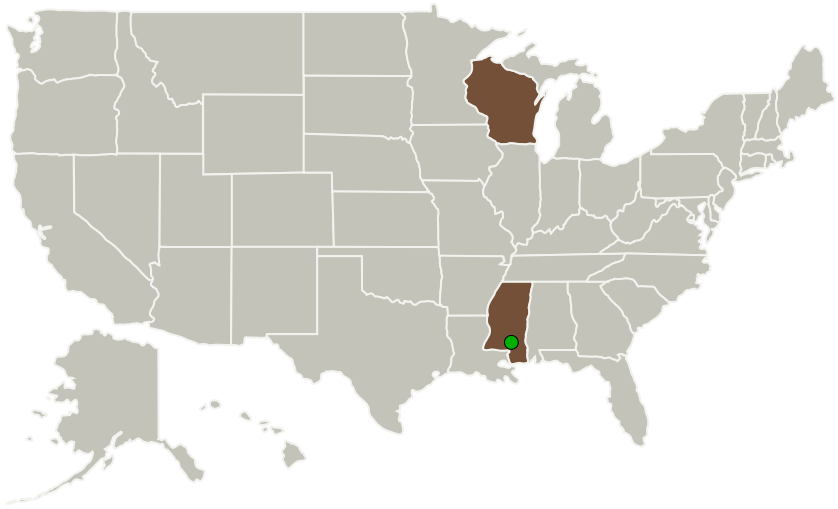
VTX HyHeat, Phase I

Completed Technology Project (2014 - 2014)

Project Introduction

In this project Orbital Technologies Corporation (ORBITEC) will utilize its unique vortex propulsion technology to develop a high-capacity heating system to heat hydrogen to extremely high temperature levels. The heated hydrogen is to be used for test purposes for nuclear rocket propulsion simulations and total exhaust recovery applications. Our vortex rocket propulsion system is able to reliably and repeatedly operate at very high levels of reliability and operating temperature. This has been demonstrated through a large number of tests conducted over more than a decade using many different propellant combinations and engine sizes. The ORBITEC Vortex is an ideal thermal energy source for the needed hydrogen heating application. In phase 1, two hydrogen heating system concepts (based on the vortex approach) will be analyzed. Basic breadboard systems will be constructed and tested.and evaluated. The feasibility of extended duration hot hydrogen production will be demonstrated. In phase 2/3, a larger operational system will be developed, tested, delivered, and installed at the NASA Stennis Space Center.

Primary U.S. Work Locations and Key Partners



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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Sierra Nevada Corporation(SNC)	Lead Organization	Industry Women-Owned Small Business (WOSB)	Sparks, Nevada
Stennis Space Center(SSC)	Supporting Organization	NASA Center	Stennis Space Center, Mississippi

Primary U.S. Work Locations	
Mississippi	Wisconsin

Project Transitions

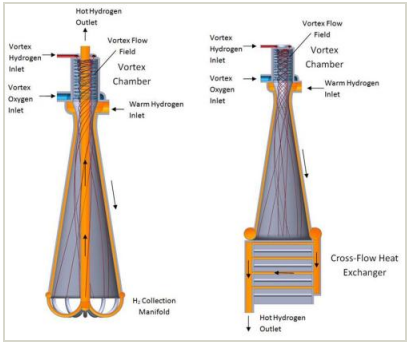
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137730)*

Images



Briefing Chart
VTX HyHeat, Phase I
(https://techport.nasa.gov/image/133022)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Sierra Nevada Corporation (SNC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

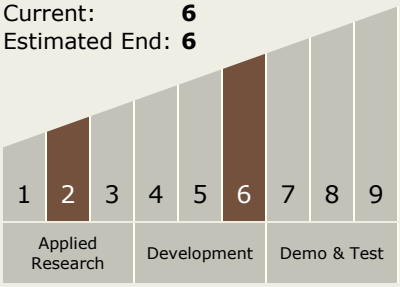
Carlos Torrez

Principal Investigator:

Millicent R Coil

Technology Maturity (TRL)

Start: **2**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.4 Advanced Propulsion
    - TX01.4.3 Nuclear Thermal Propulsion

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System